PROC. BIOL. SOC. WASH.
93(4), 1980, pp. 963–970

A NEW FISH SPECIES OF THE GENUS *VANDERHORSTIA* (TELEOSTEI: GOBIIDAE) FROM THE AMIRANTE ISLANDS, INDIAN OCEAN

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Abstract.—*Vanderhorstia praealta,* a new species of the fish family Gobiidae, is described from the Amirante Islands, Indian Ocean. *Vanderhorstia praealta* resembles the *Cryptocentrus*-like gobies, a large group of more than 60 species comprising at least seven genera. We provisionally place *V. praealta* in the genus *Vanderhorstia* because it lacks vertical rows of cutaneous papillae on the cheek, has a moderate number of scales in the lateral series (54), a moderate gill opening, and an elongate caudal fin. *Vanderhorstia praealta* has an extremely elongate first dorsal fin; spines I–III are longest, about equal in length and 62.5% of the standard length. The species is known by only one specimen.

The new species was captured by the field crew of the Seychelles Islands Program, 1964, of the U.S. National Science Foundation International Indian Ocean Expedition organized by James E. Böhlke, Academy of Natural Sciences, Philadelphia. We provisionally place this species in the genus *Vanderhorstia* Smith (1949:103). Superficially our new species resembles the *Cryptocentrus*-like gobies, a large group of more than 60 species of which the following genera are probably interrelated: *Cryptocentrus* Valenciennes, *Amblyeleotris* Bleeker, *Mars* Jordan and Seale, *Vanderhorstia* Smith, *Flabelligobius* Smith, *Ctenogobiops* Smith, and *Eilatia* Klausewitz. A single character is often used to distinguish among these genera. The most frequently used generic (or group) characters are: number of vertical and horizontal rows of cutaneous papillae on the cheek; length of caudal fin; extent of gill opening; size and number of rows of teeth in the jaws; kind and number of scales on the trunk; presence of tubular nares; shape of head (depressed, compressed); length of snout; and width and contour of gape. One can demonstrate with ease that a particular gobiid species is new, but to allocate it properly to a genus is difficult. This problem has resulted in the description of many new genera without any meaningful, comparative analysis of generic characters and their generic group affinities. Our new species lacks vertical rows of papillae on the cheek and therefore does not agree with the generic concept that Hoese and Steene (1978:382) presented for *Cryptocentrus* and *Amblyeleotris,* each having variously developed vertical

or transverse rows of papillae on the cheek. On the basis of the development of papillae on the cheek, the genus *Mars* (including *Obtortiophagus* Whitley as a synonym) should be linked with the *Cryptocentrus-Amblyeleotris* group. The four other nominal genera—*Vanderhorstia, Flabelligobius, Ctenogobiops* and *Eilatia*—have no vertical rows of papillae on the cheek. *Flabelligobius* has a long jaw, a pointed snout, minute scales numbering over 100 in the lateral series, and a narrow gill opening restricted to the pectoral fin base (Smith, 1959:205, fig. 22). *Ctenogobiops* has ctenoid scales, and the gill opening is extensive (Smith, 1959:191). *Eilatia* has cycloid and ctenoid scales, and a restricted gill opening; the caudal fin is longer than the head length, and the head is depressed (Klausewitz, 1974:206). *Vanderhorstia* has about 50–65 scales in the lateral series, and cycloid and ctenoid scales; the gill opening is wide (Smith, 1959:192). Our new species has no vertical rows of papillae on the cheek, has 54 scales in the lateral series, all cycloid scales, a moderate gill opening, head moderately round, caudal fin longer than length of head, teeth of jaws caninoid, in 2 to 4 rows, and the anterior nares opening on a short tube. The first dorsal fin spines I–IV are very long and spines I–III are nearly equal in length. The combination of these characters does not agree with the characters listed for any of the above seven genera. Some characters, such as the width of the gill opening, may be less variable among the genera and species than the number of scales on the trunk or the length of the caudal fin. However, all of the characters mentioned above must receive a comparative evaluation among all of the related nominal genera and included species in order for us to ascertain practical or natural generic groupings. We place our new species in *Vanderhorstia* because of the moderate number of scales in the lateral series, the moderate gill opening and the elongate caudal fin. Also, the genus *Vanderhorstia* has priority among the nominal *Cryptocentrus*-like gobies that lack vertical rows of cheek papillae.

The methods of taking and recording counts and data are given in Lachner and McKinney (1974, 1978).

Important comparative material studied for generic determination includes: *Amblyeleotris guttata,* USNM 220084, Philippines; *Amblyeleotris randalli,* USNM 220085, Philippines; *Cryptocentrus cryptocentrus,* USNM 220078, St. Brandon Shoals, Indian Ocean; *Ctenogobiops crocineus,* USNM 220080, Philippines; *Mars caeruleomaculatus,* Field Mus., sta. no. LW-5, Gulf of Mannar, S. India; *Mars strigilliceps,* USNM 220083, Philippines, and USNM 220077, off Somali coast, Indian Ocean; *Vanderhorstia delagoae,* Acad. Nat. Sci. Philadelphia, sta. no. F-119, Seychelles; *Vanderhorstia ornatissima,* Acad. Nat. Sci., Philadelphia, sta. no. F-44, Seychelles.

Vanderhorstia praealta, new species
Figs. 1–2

Holotype.—USNM 215290, female, 35.5 mm SL, from Amirante Islands, D'Arros Island, off E side, at a depth of 18.3–30.5 m, 9 Mar. 1964, collected by D. Dockins, R. Rosenblatt, W. Starck, and J. Tyler, sta. F-109, International Indian Ocean Expedition, Seychelles Islands Program 1964, Academy of Natural Sciences of Philadelphia.

Diagnosis.—Related to *Cryptocentrus*-like gobies but variously different from them in the following characters: first dorsal fin very elongate and far forward on body, its length 62.5 percent of SL, spines I–III longest and about equal in length; scales of moderate size, about 54 in lateral series, cycloid; three horizontal rows of papillae on cheek; gill opening moderate; caudal fin longer than head length; dorsal fin VI-I,10; anal fin I,10; pectoral rays 18; head, nape, base of pectoral fin, and breast with numerous, small light spots; trunk plain, light brown; the fins mostly dark.

Description.—Dorsal fin rays VI-I,10; anal fin rays I,10; pectoral fin rays 18-18; pelvic fin rays I,5; segmented caudal fin rays 17; branched caudal fin rays 13; lateral scale rows 54; transverse scale rows 24.

Scales cycloid, smaller anteriorly on trunk; scales absent on cheek, opercle, base of pectoral fin, breast, and predorsal area; scales eccentric, focal area narrow, about 9–11 primary radii and 2–3 secondary radii in large anterior field, radii absent in posterior field.

Vertebrae 10 + 16; pterygiophore formula 3(22110).

The following measurements are expressed as thousandths of the SL: head length, 250; snout length, 54; bony interorbital width, 6; greatest diameter of orbit, 73; upper jaw length, 115; predorsal length, 290; greatest depth of body, 189; pectoral fin length, 299; pelvic fin length, 245; caudal fin length, 324; pelvic fin insertion to anal fin origin, 270; first to third spines of spinous dorsal fin longest and about equal, the second spine slightly longer, its length 625.

Head cylindrical; trunk somewhat compressed; interorbital narrow, much less than diameter of eye; lower jaw equal to upper jaw, the gape wide; length of jaw extending posteriorly nearly to vertical through posterior margin of eye; anterior and posterior nares close together, the anterior nares on a short tube; tongue truncate, the tip free; gill opening moderate, extending just below and anterior to lower insertion of pectoral fin, not reaching posterior margin of preopercle; first dorsal fin extremely elongate, about five times higher than second dorsal fin; first dorsal fin far forward, the insertion above pectoral fin base; first dorsal fin membrane free from second dorsal fin; origin of second dorsal fin anterior to a vertical through anal opening;

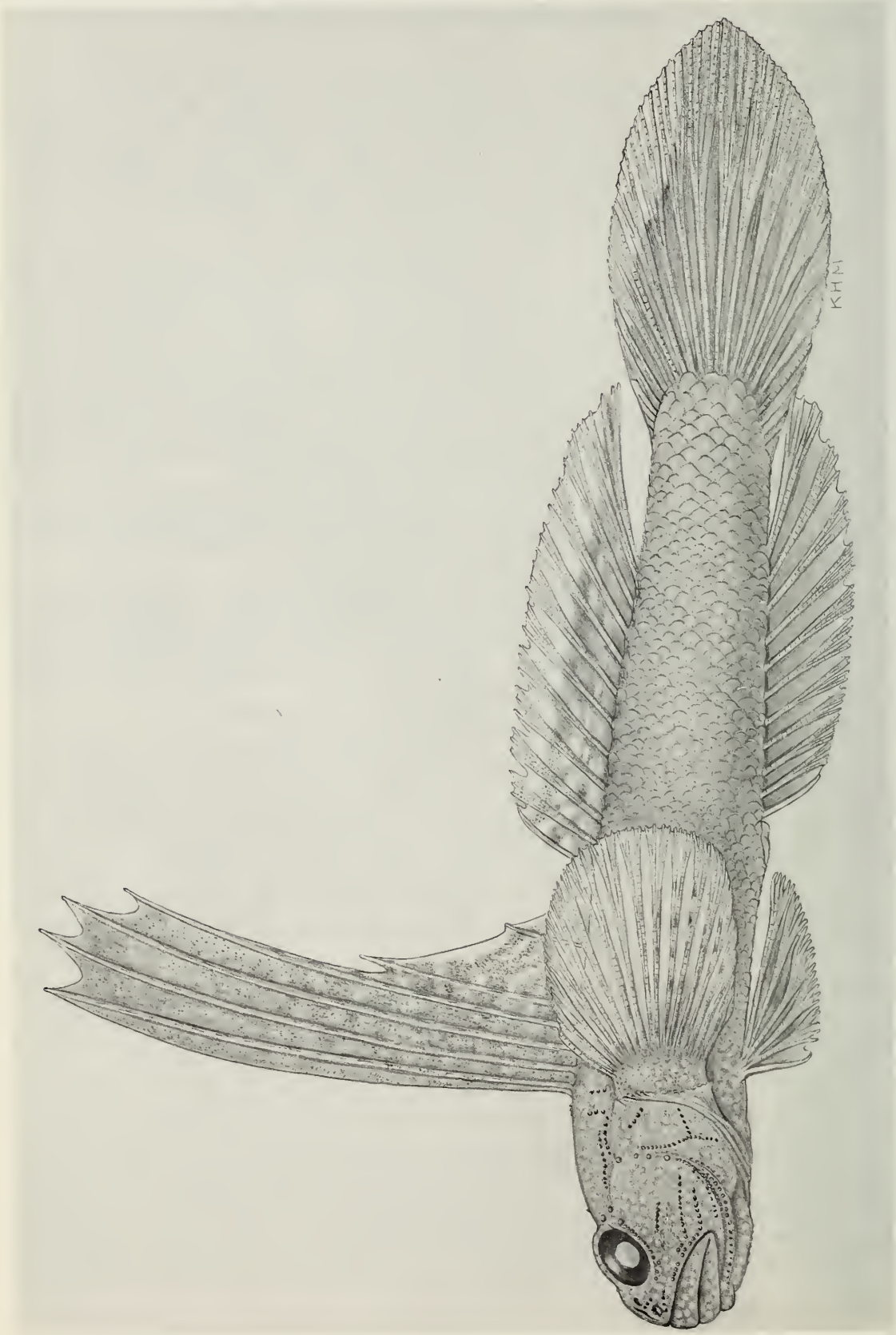

Fig. 1. *Vanderhorstia praealta*, USNM 215290, holotype, female, 35.5 mm SL, from Amirante Islands, western Indian Ocean. (Note:

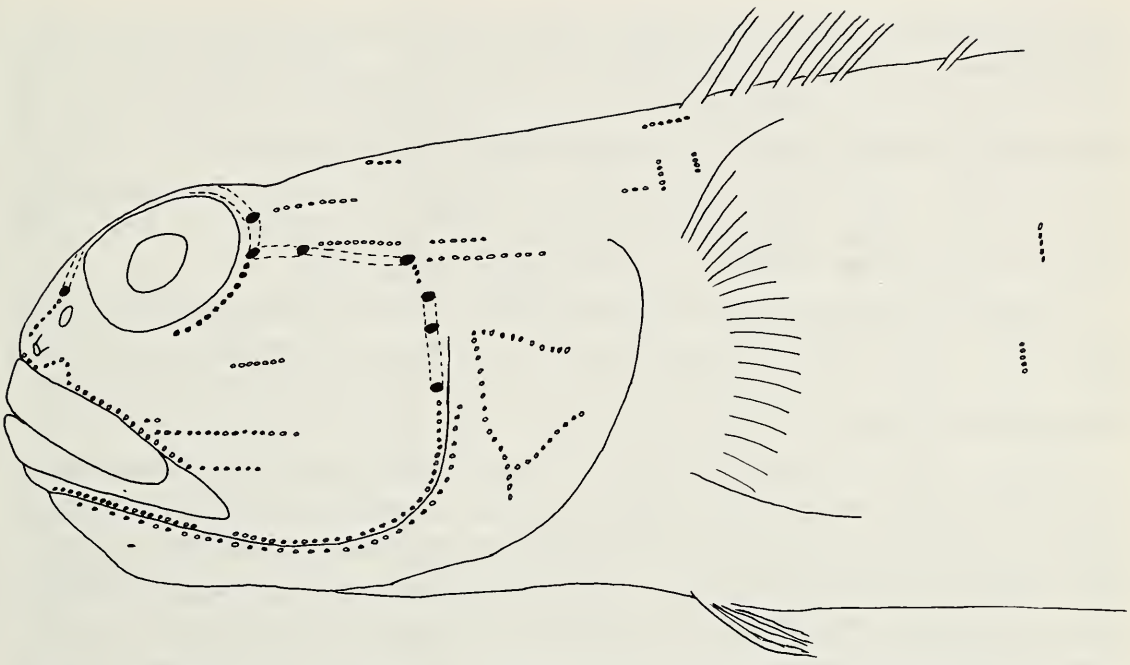

Fig. 2. Diagrammatic lateral view of head and anterior body of *Vanderhorstia praealta*, showing cephalic sensory pore and canal system (dashed lines and black spots) and sensory papillae (small open circles). Interorbital pores not shown. See Lachner and McKinney (1978) for pore and papillae terminology.

adpressed pectoral fin extends posteriorly to a vertical through anal opening; pectoral fin longer than deep, the posterior margin round; pelvic fin, when adpressed, reaches anal opening; pelvic frenum well developed, the inner pelvic fin rays connected to tip, the rays multibranched; anal fin as high as second dorsal fin; caudal fin longer than deep, longer than head, the posterior margin pointed; genital papilla bulbous, wider than long.

Teeth in upper jaw caninoid in four rows medially, reduced to two rows laterally; teeth in outer row about three times longer than those of inner row; teeth of lower jaw caninoid, in a patch of 3–4 rows medially and two rows laterally; those on outer row and laterally on inner row longest, about two times as long as the other teeth of lower jaw; no vomerine or palatine teeth.

The cutaneous papillae system consists of small structures in a few rows on the head and trunk (Fig. 2). The important diagnostic papillae consist of three short horizontal rows on the cheek and a suborbital row beneath the posterior half of the eye, terminating at the AOT sensory pore. There are no vertical papillae rows on the cheek. Other obvious rows of papillae are: a row above margin of upper jaw; short rows on snout anterior to NA pores and between them; two preoperculo-mandibular rows; a short lateral cephalic row extending posteriorly from the IT pore and a longer, secondary lateral cephalic row extending posteriorly from about the POT pore to above

the mid-opercular area; a short row extending posteriorly from SOT pore; a short row on each side of midline of nape; short, scattered vertical rows above insertion of upper pectoral fin; short, staggered, vertical rows on trunk, along midline and belly, each row encompassing about 2–3 scales; a row bordering the lower margin of the sixth and ninth segmented caudal fin rays and one on the upper margin of the twelfth segmented ray. The three rows on the opercle common to most gobies are present.

The cephalic sensory pore system consists of the following pores: paired NA, SOT, AOT, POT, IT and three POP pores, and unpaired AITO and PITO pores on the midline of the head. There is a deep, transverse groove immediately behind the eyes.

Color in preservation.—All of head except dorsal portion of occipital area with numerous, small, pale to white, circular spots over a light brown background. The pale spots are best developed on snout, lips, cheek and opercle. Pale spots are also on the breast and base of the pectoral fin. The trunk is uniformly light brown with fine, dark brown, pepper-like specks. The spinous dorsal fin is mottled in light and dark brown irregular markings; the lower half is light brown and the outer half darker brown. There are alternating, circular, pale spots and brownish areas on the lower two-thirds of the first five interradial membranes of the soft dorsal fin; the posterior, lower two-thirds portion has pale elongate spots in one or two rows near the midportion of the fin; the remaining membrane and rays are brownish; the membrane and rays of the outer third of the soft dorsal fin are transparent; the interradial membrane between the posterior-most two rays is brownish to black, much darker than the rest of the fin. The interradial membranes of the anal fin are brownish to black, the rays are light brown. The outer margin of the anal fin has a narrow light border. The caudal fin has a pale, elongate mark distally on the upper five branched rays, and two small pale spots on the upper margin of the procurrent rays; the remainder of the fin membrane is brownish-black. The membrane between the longest rays in the middle portion of the caudal fin is darker brown; the rays of the fin are light brown. The pectoral fin has an alternating series of elongate brown marks and light areas basally on the rays, and these spots extend about two-thirds outward on the rays of the central portion of the fin; the membrane of the fin is pale; the outer half of the upper six rays is pale; the outer third of the rest of the lower portion of the fin is pale. The pelvic fin rays are pale and the interradial membranes are brownish black. The first dorsal, second dorsal, pelvic, anal, and caudal fins are darker than portrayed in Fig. 1.

Etymology.—The specific epithet is taken from the Latin, *praealtus,* in reference to the unusually long first four elements of the spinous dorsal fin.

Discussion.—*Vanderhorstia praealta* superficially resembles two other species with high spinous dorsal fins, *Cryptocentrus pretoriusi* Smith (1959:193, fig. 5) and *Vanderhorstia mertensi* Klausewitz (1974:210, figs. 5–

7). *Cryptocentrus pretoriusi* has small scales, 100 in the lateral series; the third dorsal spine is longer than the first and second spines; the dorsal fin elements number VI-I,11 and the anal fin elements I,11; and the body coloration consists mainly of some large light spots on the head and midlaterally on the trunk. *Vanderhorstia mertensi* has intermediate sized scales, about 60 in the lateral series; the fourth spine of the spinous dorsal fin is longer than spines I–III and a large outer portion is free from the interspinous membrane; the dorsal and anal fins are long, dorsal fin elements number VI-I,16 and the anal fin elements I,17–18; and the body coloration consists of moderately sized light spots on the head, nape and on the dorsal fins, and several weak, dusky bars on the trunk. *Vanderhorstia praealta* has about 54 scales in the lateral series; spines I–IV are elongate, the tips connected by the interspinous membrane, and spines I–III are longest and about equal in length; the soft dorsal and anal fin elements number I,10. The dominant body coloration consists of small light spots on the head, nape, breast, and base of pectoral fin; the trunk is uniformly light brown and the fins are mostly dark colored, with the outer portion of the second dorsal fin and upper portion of the caudal fin light. Three species referred to the genus *Vanderhorstia* by several authors are treated in a key by Klausewitz (1974:211), namely *V. delagoae* (Barnard), *V. mertensi* Klausewitz and *V. ornatissima* Smith. *Vanderhorstia praealta* has a strikingly different color pattern from these species as well as having certain differences in meristic characters.

Polunin and Lubbock (1977:92), while working in the Seychelles, observed but did not collect a dark colored "*Cryptocentrus*" that had a high first dorsal fin; they stated that it may have been *C. pretoriusi*. This species may have been *V. praealta*.

Acknowledgments

Figure 1 was rendered by Ms. Keiko H. Moore, NMFS, U.S. National Museum of Natural History, Washington, D.C. We thank Dr. James E. Böhlke, Academy of Natural Sciences, Philadelphia, for the exchange of the holotype resulting from this cooperative, international field collecting effort. Comparative material of various nominal genera of gobies was also received from the Academy of Natural Sciences, Philadelphia, and the Field Museum of Natural History, Chicago. Ms. Susan J. Karnella, U.S. National Museum of Natural History, provided valuable comments on the manuscript.

Literature Cited

Hoese, D. F., and R. Steene. 1978. *Amblyeleotris randalli*, a new species of gobiid fish living in association with alphaeid shrimps.—Rec. West. Australian Mus. 6(4):379–389.

Klausewitz, W. 1974. Fische aus dem Roten Meer. XIV. *Eilatia latruncularia* n.gen. n.sp. und *Vanderhorstia mertensi* n.sp. vom Golf von Aqaba.—Senck. Biol. 55(4/6):205–212.

Lachner, E. A., and J. F. McKinney. 1974. *Barbuligobius boehlkei*, a new Indo-Pacific genus and species of Gobiidae (Pisces), with notes on the genera *Callogobius* and *Pipidonia*.—Copeia 1974(4):869–879.

———. 1978. A revision of the Indo-Pacific fish genus *Gobiopsis* with descriptions of four new species (Pisces: Gobiidae).—Smithsonian Cont. to Zool. 262:1–52.

Polunin, Nicholas V. C., and Roger Lubbock. 1977. Prawn-associated gobies (Teleostei: Gobiidae) from the Seychelles, Western Indian Ocean: Systematics and ecology.—J. Zool., London (1977)183:63–101.

Smith, J. L. B. 1949. Forty-two fishes new to South Africa, with notes on others.—Ann. Mag. Nat. Hist. 12(2):97–111.

———. 1959. Gobioid fishes of the families Gobiidae, Periophthalmidae, Trypauchenidae, Taenioididae, and Kraemeriidae of the Western Indian Ocean.—Ichthyol. Bull. Rhodes Univ., 13:185–225.

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